

ited so that a careful examination was impossible. Dr. O'Brien who conducted the examination found, however, that irregular portions of the small intestine were distended while other portions of the intestine were found collapsed. The distension was apparently due to a paralysis of the intestinal wall. The walls of the intestine were deeply congested in areas but nowhere was found any indication of peritonitis. The time did not permit opening of the thorax or the examination of the brain and the nervous system generally which was exceedingly desirable under the circumstances.

#### CONCLUSIONS.

1. The most important conclusion is that pellagra has been found to exist in three cases out of 180 consecutive cases admitted to a private sanitarium.

2. None of the three cases was imported to the Western coast, but evidently originated there.

3. None of the patients belonged to poverty-stricken class of people. In all cases, however, nutritional disturbances preceded a long time the development of definite evidences of pellagra.

4. In one case there is a definite history of long use of vegetable oils and this case happened to be the most acute, affecting the nervous system to the greatest extent and terminating fatally in the shortest time.

5. All three cases evidently originated without any infection from similar cases and there is no evidence that anyone was so afflicted as a result of contact with them.

6. While it can not be said that pellagra had been a causative factor in the mental or nervous breakdown of any of the three cases, it is evident that in every case it has greatly and in a detrimental way influenced the mental and nervous condition.

7. Cacodylate of sodium, tried in two of the three cases has not had any lasting beneficial effect upon the disease. The same is true of all other treatment attempted.

8. The final conclusion is that there is a real need of close study of that disease, first of all a diligent search for all cases suffering from it. It is more than likely that the number of its victims all over the United States, therefore also in California, far exceeds the estimates of most physicians.

#### NOTICE OF MEETING.

A meeting of the Northern California District Medical Society will be held in Chico on Tuesday, November 12th. A very interesting program has been provided for this meeting, and several papers will be read by physicians from San Francisco.

#### THE SIGNIFICANCE OF BACTERIA IN MILK.

By S. LEVIN, Ph. G., Ph. C.

From the Laboratory of the Napa State Hospital, Napa, California.

The advanced step which has been taken by several public health institutions and the prominence which the propaganda for clean milk has gained recently means much to the welfare of the general public. Milk, which constitutes one of the most important foods for the sick and convalescent, an article which replaces the mother's

feeding to the infant, a foodstuff which, because of its highly nutritious properties, enters almost every household in our communities, has not been given the consideration it deserves.

To our gratification, in several large cities, rules and uniform standards have been adopted, and laws enforced, which enable the sanitary condition of the public milk supply to be controlled; but, in the majority of cases, up-to-date methods of public hygiene and sanitation as far as milk is concerned have been almost entirely neglected. The standards adopted by some cities for the control of the milk are so incomplete that they do not give sufficient guaranty as to its cleanliness. The chemical standard of milk, which is one of the most prominent points in various places in their milk ordinances, is of secondary importance from a standpoint of public health. While it safeguards the people from fraudulent methods in business transactions, it almost entirely ignores its sanitary condition.

It has been agreed by numerous workers after thorough investigations along the line of the bacteriological examination of milk, that milk, by itself, is practically sterile and the high number of bacteria usually found in commercial milk is due to external contamination only.

Rosenau<sup>1</sup> has found respectively 60, 160, 400, and 500 bacteria per c. c. of milk from individual cows by applying sufficient cleanliness.

Wellem and Miele<sup>2</sup> have obtained milk containing two and one-half bacteria per c. c., using aseptic methods.

Wyman<sup>3</sup> claims that milk can be obtained from healthy cows in small quantities entirely free from micro-organisms.

The writer has obtained samples from healthy cows by applying ordinary precautions as to cleanliness as low as 0, 40, 60, 70, 80, 100, 120, and 160 bacteria per c. c.

To establish the difference in the number of bacteria present in milk where precautions as to the milking and handling of same are taken and of that where methods of sanitation are ignored, a series of experiments were undertaken.

The isolation of the pathogenic organisms was not attempted, except that in the case of the mixed milk *B. coli* were looked for.

The media, plating, and the procedure of the examination were made in accordance with the standard methods adopted by the laboratory section of the American Public Health Association.

I am indebted to Mr. C. N. Whitaker, Steward of Napa State Hospital, for his kindness in placing the necessary material and cows at my disposal which made the undertaking possible.

Experiment No. 1. A herd of twenty cows was taken from a dairy where the most rudimentary sanitary principles connected with the obtaining of milk were neglected; barn yards filthy, cows dirty, milk utensils washed with water found to be contaminated with *B. coli*, milkers of slovenly appearance to whom personal hygiene was unknown, pails wide-mouthed, which, in case the cow should happen to urinate in the process of milking, would not prevent the urine from dripping into the contents of the pail.

Experiment No. 2. Samples obtained under same

circumstances, except that narrow-mouthed vessels cleansed in hot, boiling water were used.

Experiment No. 3. Cows cleaned, udders washed with lukewarm water and wiped with a clean cloth, vessels narrow-mouthed and cleansed in hot boiling water, milker's hands scrubbed with soap and clean water and wiped dry with clean towel, milker dressed in clean white gown.

The following results were obtained:

#### EXPERIMENT NO. 1.

Cow No.	After 3 Hr. at Room Temp. Bact. per c.c.	After 20 Hr. at Room Temp. Bact. per c.c.	After 20 Hr. at Temp. 11° c. Bact. per c.c.
1	4,000	9,000,000	10,000
2	16,000	19,000,000	26,600
3	4,800	2,400,000	5,800
4	39,600	8,000,000	46,400
5	16,200	3,200,000	19,000
6	42,500	17,001,000	34,000
7	15,300	9,500,000	27,000
8	16,000	4,000,000	42,000
9	24,100	29,000,000	36,000
10	14,000	12,000,000	30,000
11	29,000	4,006,000	34,000
12	11,800	5,000,000	19,000
13	48,000	126,000,000	62,000
14	30,000	19,000,000	1,050,000
15	12,000	12,250,000	26,000
16	19,300	6,000,000	28,000
17	36,000	4,350,000	44,000
18	14,000	2,000,000	24,000
19	19,000	2,000,000	300,000
20	33,900	11,000,000	116,000
Minimum	4,000	2,000,000	5,800
Maximum	48,000	126,000,000	1,050,000
Average	22,275	15,235,350	98,980

#### EXPERIMENT NO. 2.

Cow No.	After 3 Hr. at Room Temp. Bact. per c.c.
1	2,900
2	9,000
3	3,960
4	17,600
5	5,000
6	19,000
7	13,000
8	12,300
9	19,600
10	12,400
11	4,000
12	9,800
13	13,000
14	26,000
15	19,000
16	7,100
17	4,300
18	4,200
19	9,100
20	12,000
Minimum	2,900
Maximum	26,000
Average	11,163

The difference in the bacterial count of series No. 2 and No. 1 shows that clean utensils play an important part in the obtaining of clean milk, and when milk holders are washed with boiling hot water and free from contamination the milk contains a lower count of bacteria.

#### EXPERIMENT NO. 3.

Cow No.	After 3 Hr. at Room Temp. Bact. per c.c.	After 20 Hr. at Room Temp. Bact. per c.c.	After 20 Hr. at Temp. 11° c. Bact. per c.c.
1	240	126,000	8,000
2	160	119,000	10,100
3	480	1,112,000	14,100
4	600	28,000	9,000
5	1,800	79,000	32,000
6	150	142,600	6,000
7	70	19,480	8,000
8	190	124,000	12,000
9	200	37,000	14,500
10	4,000	2,262,000	28,000
11	120	138,000	8,000
12	60	114,000	4,600
13	120	125,000	3,400
14 dil. 1/100	0	12,000	4,000
15	4,800	2,369,000	21,000
16	40	16,000	12,750
17	160	1,118,000	19,000
18	6,900	1,449,000	11,000
19	140	24,600	9,000
20	80	13,600	14,000
Minimum	0	12,000	3,400
Maximum	6,900	2,262,000	28,000
Average	1,020	471,414	12,422

#### MIXED HERD (20 Cows)—EXPERIMENT NO. 1.

After 3 Hr. at Room Temp. Bact. per c.c.	After 20 Hr. at Room Temp. Bact. per c.c.	After 20 Hr. at Temp. 11° c. Bact. per c.c.	B. Coli Present
59,000	114,000,000	92,000	Present

#### MIXED HERD (20 Cows)—EXPERIMENT NO. 3.

After 3 Hr. at Room Temp. Bact. per c.c.	After 20 Hr. at Room Temp. Bact. per c.c.	After 20 Hr. at Temp. 11° c. Bact. per c.c.	B. Coli
6,790	1,260,000	22,000	None

From the foregoing obtained results, and from observations of numerous investigators, it is evident that the high number of bacteria found in milk is due to external contamination or because of its age.

The well-known phenomenon of germicidal properties of milk studied by Park,<sup>4</sup> Conn,<sup>5</sup> Hunziker,<sup>6</sup> Rosenau and McCoy<sup>7</sup> and others has been almost universally recognized, and it is expected that milk delivered from seven to eight hours after it is drawn should have a decrease in their number, and, by keeping same on ice, germicidal properties are much more prolonged; consequently, when the number of bacteria after eight to ten hours is high, it undoubtedly is an indication that the initial introduction of the bacteria was enormous or the milk is old, which also could be remedied by using sufficient cold.

With stringent precautions as regards cleanliness and modern appliances in handling, milk can be obtained with practically a very low number of bacteria.

When the cows are in surroundings of filth, dairy not in sanitary condition, where supervision is poor, and incompetent milkers—namely, indifferent to the elementary principles of observing sanitation while milking—are employed, water contaminated, utensils not taken care of, numerous

bacteria will be found in the milk as soon as same is drawn.

When the cows are cleaned, udders washed, surroundings favorable, milkers more or less intelligent, and management assumes the responsibility, realizing that milk could serve as an excellent disease-transmitting agent, sufficient cold applied, the result is clean milk; in other words, a minimum introduction of bacteria and less multiplication of same, as seen from the results of Series No. 3 and those of Series No. 1.

It seems to the writer that a bacterial count of milk is one of the most valuable aids in forming a comparative idea as to the sanitary condition of the different sources of the milk supply, and it is one of the subjects which is attracting attention among bacteriologists and public health officers, as seen from the standards adopted by many municipal governments.

The criticism as to the inconsistency of standards relative to the maximum number of bacteria to be found in milk is based:

1st. That milk is an excellent culture media for the growth of bacteria and their multiplication; consequently, the number of bacteria do not speak for its sanitary condition.

2d. That the bacteria found in milk are of a harmless variety.

In the first place, inasmuch as having established the fact that the high number of bacteria is due to the unsanitary condition of the dairies, then, even assuming that a given supply is free from dangerous contamination, it also is natural to believe that sooner or later the supply might serve as one most dangerous to health.

The well-known outbreaks of typhoid fever, scarlet fever, diphtheria, tuberculosis, and sore throat, which have been traced to the using of milk from sources where sanitary conditions were neglected, go to prove that milk with a high bacterial count is not fit to be used.

In the second place, the writer agrees and is thoroughly convinced that a hundred c. c. of milk containing one typhoid bacillus would prove more dangerous to health than millions of ordinary bacteria were found in one c. c. At the same time it is worth while realizing that even the saprophytic bacteria, under favorable conditions by their rapid multiplication and the production of their metabolic substances into the system, will occasion morbid conditions, hence so many digestive troubles, sicknesses, and the high mortality amongst infants.

Because of the above mentioned, milk with a high number of bacteria is not fit for human consumption, and it seems that the conception as to the value of the bacterial standards must be modified somewhat.

Bacterial standards based on scientific investigations adapted to the conditions of the different localities are the only best guaranty in preventing a given commonwealth from using unclean milk. The maximum number of bacteria that are to be found in milk can be brought to a specified standard, adopted only by using strict, vigorous methods

as to sanitation, and it should be the aim of the health institutions to secure enactments putting the same into practice.

In conclusion, I wish to say that the practical methods of hygiene and sanitation used by Dr. A. E. Osborne, Medical Superintendent, Napa State Hospital—to whom I owe my sincere thanks—suggested to me the idea of this undertaking.

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#### HEREDITARY PIGMENTED NEVUS?

By ALBERT SOILAND, M. D., Los Angeles.

The patient, Mrs. M., age 32, healthy and well nourished, has a very fair skin, brown eyes and abundant straight yellow hair.

She gives a history which throws no light upon the causative factors responsible for the peculiar symmetrical pigmentation around eyes and upper part of face, as shown in plate No. 1. No member of family has ever been marked in this manner,



and patient was entirely free from blemish during childhood.

Pigmentation began when she was twenty years old, became rapidly dark, and was a source of much embarrassment. Recourse was had to local applications, and cauterants of various kinds, without benefit.

Saw patient in consultation February, 1911, and found her as depicted, pigmented areas black, non-inflammatory, and no change in color upon pressure. Decided to employ the Roentgen-rays, which